

in noble gas monitoring and remaining challenges for detecting nuclear explosion signals

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The CTBTO is setting up and operating a worldwide network of stations to monitor the globe for evidence of potential nuclear tests. Radioxenon plays a crucial role when determining whether an event is of CTBT-relevance. Specific measurement systems have been developed in the past decades and recently enhanced with a new generation of noble gas systems. Tailored analysis methods have been developed and implemented by the International Data Center (IDC) to make radioxenon measurement data more and more relevant for CTBT-purposes. This is however a complex task for the IDC. A highly variable radioxenon background produced by the civil nuclear industry is likely to interfere with the potential signal of a nuclear explosion, making the identification of CTBT-specific events a challenging task. New technologies like Molten Salt Reactor may complicate the situation further. There is still huge potential for refining the radionuclide and atmospheric transport methods to better understand the radioxenon background, to make screening more discriminative and to enhance location capabilities. The challenges of radioxenon monitoring will be reviewed and the potential of further advancing knowledge will be discussed.

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